



The Oil DROP

The U.S. EPA's Oil Spill Program Internal Report
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About This Issue

This edition of the Oil DROP highlights some of the information resources available through the Oil Program Center Internet web site. We invite Oil DROP readers to visit the site to learn more about oil spill issues. We seek to continually improve and update the information presented there and welcome your comments and suggestions.

The Oil Spill Program Infoline

EPA's Oil Program Center (OPC) offers a variety of information about oil spill prevention and response through its Internet web site (www.epa.gov/oilspill). The information provided on the Internet serves as a resource for businesses that are subject to oil spill regulations, emergency personnel that respond to oil spills, students, teachers, and the general public. One of the most popular features of the web site is the e-mail infoline (on the Internet at www.epa.gov/oilspill/comment.htm or via e-mail at oilinfo@epa.gov). This feature allows the public to contact OPC personnel to ask specific questions that may not be

answered elsewhere in the web site. People who do not have access to the Internet can reach the infoline voice mail system at 1-800-424-9346.

OPC staff responds to approximately 45-70 public inquiries each month. They provide answers to oil facility owners and technical professionals about oil spill regulations, offer information to concerned citizens about how to report a suspected spill, provide information on the environmental impacts of oil spills, and respond to requests for data about oil spills. Many of the questions submitted to the OPC through the oil spill infoline come from students and teachers seeking information for specific classroom and science fair projects dealing with oil spills. OPC staff is pleased to have the opportunity to respond to questions from interested individuals.

The following are actual questions and responses drawn from the infoline archives. They are examples of the many kinds of requests the OPC receives through the infoline.

Oil Spill Cleanup

The infoline receives many requests for information about the methods used to clean up spilled oil. The following questions and responses deal with dispersant chemicals and bioremediation.

Q. What would be the easiest way to remove crude oil from sand without chemicals that are not environmentally safe? This is a school project. We have to clean up an oil spill.

A. There is no easy way to remove crude oil from sand, even without chemicals that are not environmentally safe. Sand is usually located in beach areas, susceptible to waves

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and tides; so even if you clean the beach area with water, when the tide goes up, oil will re-contaminate the part that was cleaned previously. The easiest thing to do is to prevent the oil from spilling!

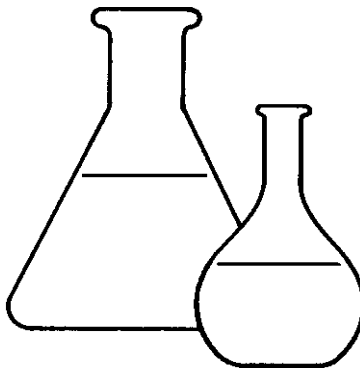
Dispersants are a group of chemicals used for cleanups but they are only used in special cases, usually and in a marine environment.

Dispersants are used sparingly, if at all, in freshwater areas (lakes, rivers, watersheds, etc.) because they might cause additional damage to animal habitats and plants that are common to these waterways. The use of dispersants needs to be pre-approved by a federal on-scene coordinator (OSC) before they can be used in freshwater areas.

Oil spills that occur in marine areas are usually far from populated areas. Freshwater spills are usually much closer to sensitive areas such as: residential neighborhoods, drinking water sources, populated areas and endangered species locations.

If you access our web site at **www.epa.gov/oilspill/what.htm** you can find our National Contingency Plan (NCP) Product Schedule with information on chemical dispersants normally used to clean up oil spills.

You can also access our Response web page through the address below: **www.epa.gov/oilspill/eduhome.htm**. Our publication entitled *Understanding Oil Spills and Oil Spill Response*, has information regarding oil spills and clean up operations on salt marshes and mangrove forests in the "The behavior and effects of oil spills in the marine environment" chapter. This publication can be



downloaded using Acrobat Reader 3.0. On this web page, you will also find several links for photographs and information on prevention, response, and preparedness for oil spills.

Q. I am doing a research project on oil spill cleanup; do you have any information you could provide about bacterial cleanup of oil spills or related topics?

A. The Oil Pollution Act of 1990 (OPA) gives the EPA authority to "research, develop and demonstrate improved technologies systems for mechanical, chemical, biological, and other methods (including the use of dispersants, solvents and bioremediation) for the recovery, removal, and disposal of oil, including the evaluation of the environmental effects of the use of such systems"; (besides expanding research, it also calls for extending the prevention, preparedness, and response activities). Currently, however, there is little funding for these R&D activities.

Biological agents are chemicals or organisms that increase the rate at which natural biodegradation occurs. Biodegradation is a process by which microorganisms such as bacteria, fungi, and yeast break down complex compounds into

simpler products to obtain energy and nutrients. Biodegradation of oil is a natural process that slowly - sometimes over the course of several years - removes oil from the aquatic environment. However, rapid removal of spilled oil from shorelines and wetlands is necessary in order to minimize potential environmental damage to these sensitive habitats.

Bioremediation technologies can help biodegradation processes work faster. Bioremediation refers to the act of adding materials to the environment, such as fertilizers or microorganisms, that will increase the rate at which natural biodegradation occurs. Two bioremediation technologies that are currently being used in the United States for oil spill cleanups are fertilization and seeding.

Fertilization, also known as nutrient enrichment, is the method of adding nutrients such as phosphorus and nitrogen to a contaminated environment to stimulate the growth of the microorganisms capable of biodegradation. Limited supplies of these nutrients are naturally occurring and usually control the growth of native microorganism populations. When more nutrients are added, the native microorganism population can grow rapidly, potentially increasing the rate of biodegradation.

Seeding is the addition of microorganisms to the naturally occurring microorganism population. Sometimes species of bacteria that are not native to an area will be added to the native population. (These foreign bacteria may be naturally occurring in other areas or might be genetically engineered). As with

fertilization, the purpose of seeding is to increase the population of microorganisms that can biodegrade the spilled oil.

Tests of methods to enhance biodegradation in water have shown little or no improvement over the naturally occurring biodegradation. Use of bioremediation on impacted shorelines (lakes, rivers, and sea), however, has apparently been successful in some cases. During the *Exxon Valdez* incident, 70 miles of shoreline were coated with two kinds of nitrogen and phosphorus-bearing fertilizers to boost indigenous bacterial populations. Initial results are inconclusive, but the data are still being evaluated (Exxon should be finished with its restoration installments for the damage done in Alaska by 2001). One difficulty is measuring the effectiveness of the technique.

Proponents of bioremediation say it is potentially the least damaging and least costly of cleanup methods, particularly for soiled shorelines. Its use on water, however, would appear to be limited except perhaps as a follow up to other actions. The major disadvantage of bioremediation is the long time frame involved. On shorelines where it could take 5 to 7 years for oil to break down under natural conditions, bioremediation using fertilizer could reduce that to 2 to 5 years. Research needs to be conducted on the effect on local habitats from increased microbial populations and nutrient levels.

Efforts to engineer new microorganisms or to identify and cultivate more efficient ones may be promising.

Student Research Projects and Experiments

Q: I am a sophomore in high school and am doing a research project for my science class. I plan to create two identical habitats for two identical plants. I intend to put oil in one of the habitats and observe the effects of the oil over a few weeks. I hope you can recommend a small plant that is commonly hurt in oil spills. I need to use a small plant that will fit into containers. I would be very grateful for any information you could send me.

A: Salt marshes are one type of aquatic habitat that can be affected by oil spills. Some studies have been conducted on the effects of oil spills in this habitat. One very common salt marsh plant is a type of grass called *Spartina alterniflora*. Other species such as the *Spartina patens* and *Distichlis spicata* are also sensitive to oil spills. A study conducted after an oil pipeline spill found both of these species to be affected. These species of grass can be found in mangrove swamps as well as salt marshes. You can find samples of these grasses in garden centers, shops and nurseries in your area.

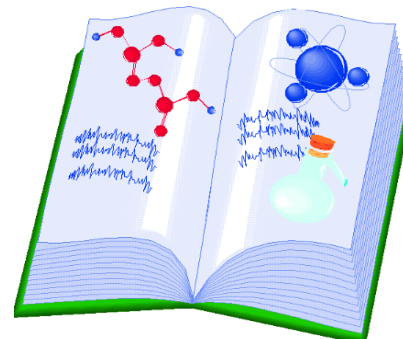
You might also want to think about using vegetable oils such as soybean oil or olive oil in your experiment. Vegetable oils are also stored in large tanks and are regulated by the EPA. They can cause severe damage to plants and animals much like petroleum oils can. In addition, your experiment should be monitored by your science teacher and he or she can recommend a science professor from one of your local universities to oversee your experiment.

Q: I am a junior in high school working on a science fair project that involves the cleanup of water after an oil spill has occurred. My experiments will be done in a contained site using a very small amount of oil (less than 1 gal). Please contact me with any information, samples of products you use, or people to contact that may be helpful. Any help you can provide will be greatly appreciated.

A: Please access our web site, www.epa.gov/oilspill and click on our Learning page link, www.epa.gov/oilspill/eduhome.htm. You will find information on oil spills, including clean up methods and experiments you can perform.

A link to our publication entitled *Understanding Oil Spills and Oil Spill Response* is located at the bottom of that page. The publication describes oil spill experiments you can perform in the classroom. This chapter explains the various clean up techniques associated with oil discharges.

There are several companies testing the capabilities of various sorbent materials including sorbents made from natural sources such as the fibers from banana peels and human hair. You may want to use feathers as sorbents in



your oil spill cleanup experiment. The use of feathers as sorbents for experiments in cleaning up oil spills is very popular.

Furthermore, the National Contingency Plan Product Schedule has information on dispersants and other chemicals used for cleaning up oils. There are telephone numbers you can call to obtain information regarding the manufacturers or distributors for gelling agents as well as other products. You may be able to obtain samples to use in your experiments.

Remember that if you use these products on oil, you must take them to a recycling center or automobile service station for proper disposal.

SPCC Plans

In order to prevent oil from spilling, and to control and contain oil when it is spilled, EPA regulations require many facilities that store oil to prepare a Spill Prevention, Control, and Countermeasure Plan (SPCC plan). In some cases regulations also require facilities to prepare Facility Response Plans (FRPs). The Oil Program receives many questions and comments from facility owners, operators, and engineers regarding SPCC and FRP plan requirements.

Q. I am a professional engineer and have been asked to re-certify an SPCC plan for a pulp and paper mill. The existing plan includes specific reference to two 500-gallon hydraulic oil tanks. Upon inspection I found these tanks to be acting as on-line sumps for

manufacturing equipment, not as storage tanks. These vessels and related equipment are located outside and have containment structures.

If the vessels in question are not storage tanks, do they have to be referenced specifically in the plan? If so, will all sumps or oil containers of any shape or size on the facility need to be referenced specifically in the plan?

A. Yes, even though they are not acting as storage tanks they must be referenced in the SPCC plan. All storage areas and potential spill sources are subject to the requirements of the SPCC regulation. Any piece of equipment, operational instrument, tank, or sump that contains product, is considered to be a container.

Q. I am working on a facility that provides gasoline to recreational boats. Fuel storage (4000 gallons) is located on the dock in secondary containment. Storage is located over the water. The regulations differentiate between onshore vs. offshore. What applies to this case? Onshore appears to be more restrictive.

I assume that a facility response plan is required rather than an SPCC in this case.

A. Your facility is located on a dock, which makes it onshore rather than offshore. Offshore usually refers to drilling rigs. You do not store 42,000 gallons or more, so you are not required to prepare a Facility Response Plan (FRP). In addition, you need to make sure that when pumping product onto your storage tank, you have catchment basins around your fuel lines. According to the SPCC rule, the owner/operator of the marina is solely responsible for any discharges into the environment. EPA will soon be posting an outreach guide for marinas on the Internet site. The guide will cover three main topics:

- *Containment and Diversionary Structures Appropriate for Onshore and Offshore Areas of a Facility [40 CFR 112.7(c)]*
- *Oil Storage: Bulk Storage Tanks, Portable Tanks, Drums, and Oil Containing Equipment [SPCC: 40 CFR 112.7(e)(2)]*
- *Onshore Aboveground Storage Tanks (ASTs)*

You may also contact the Regional EPA office located in your area for any further information regarding your facility.



Q. I am seeking guidance on the applicability of the SPCC requirements to facilities storing coal tar and creosote. Do SPCC requirements consider these substances to be oil?

A. Under 40 CFR 112.2, Oil Pollution Prevention, Definitions, "oil means oil of any kind or in any form including, but not limited to, petroleum, fuel oil, sludge, oil refuse, and oil mixed with wastes other than dredged spoil." In the case of creosote, if it is mixed with oil or waste oil it is considered an oil and facilities that store it must meet SPCC requirements. If it is creosote not mixed with oil, it is considered a hazardous waste and is regulated under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). Coal tar is considered an oil; vessels containing coal tar should be counted toward the total aggregate oil storage of the facility.

Responding to Spills

Q: I am planning a training program for fire and emergency services at a U.S. Army facility and would like information on oil spill response training. Is there an annual training requirement? If so, what topics need to be covered and how many continuing education hours are needed. I would appreciate any information or references that you might have.

A: As part of EPA's comprehensive program for protecting the public and the environment from oil and hazardous materials spills, the Emergency Response Division of the Office of Emergency and Remedial Response has

developed the Environmental Response Training Program (ERTP). ERTP courses are designed for personnel who respond to emergencies or who investigate and clean up sites where oil and hazardous materials were spilled.

Please contact ERTP for a list of course offerings:

Environmental Response
Training Program
U.S. Environmental Protection
Agency
26 W. Martin Luther King Drive
(B-3)
Cincinnati, Ohio 45268
(513)569-7537

Q: I am interested in learning more about how to respond to small scale, on-land oil and gasoline spills. I am particularly concerned about protection of groundwater resources, and would like to develop a response procedure to describe appropriate activities following the spill of say, a jerrican of gasoline. If you have any information, or could direct me to appropriate resources I would appreciate that very much!

A: In the past, published information regarding oil spill cleanup has focused primarily on water spills. However, new efforts are underway to create guidance and informational materials for on-land spills. The document available through the EPA Oil Spill Web Site entitled *Understanding Oil Spills and Oil Spill Response* (available at www.epa.gov/oilspill/docs/underoil.pdf) is currently being updated to address on-land spills. Information is also currently being updated at the "Response Tactics - Land" section of the Oil Spill Web Site (www.oil-spill-web.com/).

U.S. EPA's Underground Storage Tank Office (OUST) may have more information on gasoline spills and underground storage discharges. OUST regulates underground storage tanks which are commonly used to store gasoline as well as other materials. The Underground Storage Tank Office web address is www.epa.gov/oust.

Nonpetroleum Oils

The Oil Program Center covers edible oils and mineral oils as well as petroleum oils. The infoline receives many inquiries about these nonpetroleum oils.

Q. I am curious about the butter that is put on popcorn in the movie theater, which is oil. If that butter is spilled, does the person who spilled it need to call the EPA?

A. Butter and other edible oils are regulated by the EPA. If these oils are also stored in large quantities, and there is a potential for discharge near a sensitive area, the owner or operator of the storage facility needs to report any spill to the EPA and local emergency responders.

Please access our web site at www.epa.gov/oilspill/docs/index.htm. You can download the July 1998 issue of the Oil Program Center Update (in Adobe portable document file format). This issue contains examples of vegetable oil and animal fat spills that have occurred.

Even though these oils are edible, they are harmful to the environment if spilled in large quantities.

Q. Is storage of vegetable (canola) oil subject to the requirements of the Oil Pollution Prevention Act, including the preparation of SPCCs?

- A. Yes, canola oil or any other vegetable oil is subject to the requirements of the Oil Pollution Prevention Act, including the preparation of SPCCs.

Vegetable oils, animal fats, and petroleum oils share common chemical and physical properties and produce similar environmental effects. They can also contain toxic components and produce similar acute toxic effects, chronic toxicity, and carcinogenicity. Moreover, oil pollution seriously damages the terrestrial and aquatic environment.

Under the Clean Water Act, the definition of oil includes oil of any kind and any form, such as petroleum and nonpetroleum oils. Generally, oils fall into the following categories: crude oil and refined petroleum products, animal fats and vegetable oil, other oils of animal or vegetable origin, and other nonpetroleum oils. Many substances are easily recognizable as oils (e.g., gasoline, diesel, jet fuel, kerosene, and crude oil). However, under the CWA definition, many other substances are considered oils which may not be easily

recognizable as oils by industry, including mineral oil, oils of vegetable and animal origin, and other nonpetroleum oils.

Please contact your local EPA Regional office for more details on how to prepare an SPCC plan.

When to Report a Spill

- Q. We have a facility that has a sump designed to receive various routine leaks during the course of operations. The sump is regulated by an NPDES permit and is limited for oil and grease. On three occasions in the past few years, oil has entered the sump and been discharged to the receiving stream. It is not known whether or not the oil and grease limit was exceeded. The oil entered the sump due to a leak while removing oil from a turbine, leaking packing, and a malfunctioning automatic greaser. All of these releases were reported. Could we have used the reporting exemption? If not, when does the exemption apply?**

- A. The law that applies for the reporting exemption for discharges regulated by an NPDES permit is Section 311(a)(2) of the CWA, which excludes all oil or hazardous substance discharges authorized by an NPDES permit as well as "continuous or anticipated intermittent discharges. . . identified in a permit or permit application . . . which are caused by events occurring within the scope of relevant operating or treatment systems."

This means that the exemption only applies when you are meeting the limits of your NPDES permits, but if you (or

your facility) are exceeding them, then you need to report them, because the exemption no longer applies. The excess oil discharge caused by a faulty piece of operating equipment is excluded as a permit violation, but a violation occurring during a downtime repair is covered by Section 311.

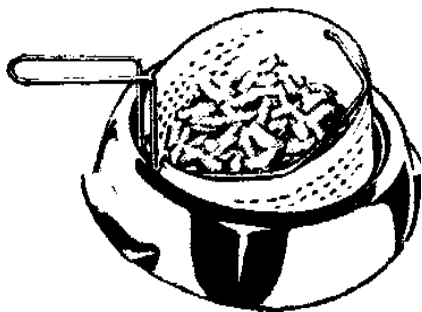
More information about when to report a spill and spills that are exempt from reporting is available on our web site at www.epa.gov/oilspill.oilwhen.htm.

Pipelines

- Q. I would like to know if a digital data set that shows pipelines in the United States is publicly available. If this is not available, can you inform me of a source where I might purchase a map of U.S. pipelines? My objective is to overlap the pipeline network onto a geographic map.**

- A. Our office, the U.S. EPA Oil Program Center, regulates non-transportation facilities storing any kind of oil and has regulations for preventing, preparing, and controlling the release or discharge of oil into the navigable (rivers, lakes, watersheds, wetlands, etc.) waters of the United States. Our main regulation, the Spill Prevention, Control and Countermeasure (SPCC) plan requires that oil storage facilities implement a plan to prevent any discharge of oil.

Pipelines are regulated by the U.S. Department of Transportation (DOT). The office that works with pipelines is the Research and Special Programs Administration (RSPA), Office of Pipeline Safety (OPS). The URL address for that office is ops.dot.gov.



You should also contact the U.S. Geological Survey (USGS); it is the mapping agency for the federal government. Their web site address is www.usgs.gov/. Their mapping web address is mapping.usgs.gov/.

Volunteering

Q. I am a freshman at Northern Arizona University in Flagstaff. I am currently enrolled in an Environmental Ethics class and we are starting a project dealing with a certain environmental issue. I have chosen to do my project on the tragic results oil spills have on the ecological system. I need to somehow get involved by writing letters to someone or volunteering to help in any way, shape, or form. Please send me any information or ideas on something I could do to get involved. I would greatly appreciate it.

A. The Oil Program Center Office is not aware of any volunteer opportunities in Arizona. You may want to contact the Marine Wildlife Veterinary Care & Research Center in Santa Cruz, CA. This organization offers their services during oil spills clean up efforts and trains volunteers. If you want to interview a volunteer to obtain any other information, call Faith Sorensen, Volunteer Coordinator, at (916) 323-4731 or Judy Gauthreaux, Assistant Volunteer Coordinator at (916) 327-1926. This group works closely with the Oiled Wildlife Care Network, Wildlife Health Center in the University of California, Davis.

You should also access the State of California's Spill Prevention and Response web site. The address is [www.dfg.ca.gov/Ospr/](http://www.dfg.ca.gov/Ospr/index.html)

index.html. The latest information on spills can be viewed at www.dfg.ca.gov/Ospr/news/news.html. This link can provide you with possible leads to volunteering opportunities.

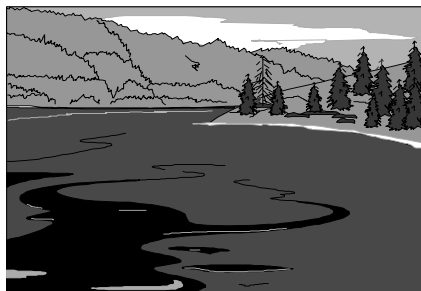
You can also visit the Wildlife Health Center web page at www.vetmed.ucdavis.edu/whc, and the Oiled Wildlife Care Network web page at www.vetmed.ucdavis.edu/owcn for up-to-date information on wildlife rescue and rehabilitation.

Product Promotions

From time to time the infoline receives announcements about new response products such as the following:

Q. I have a product that will absorb oil, lock it in, stabilize it, and not allow it to seep back out. It is a natural mineral, not a by-product, and has been tested by The Mineral Lab of Colorado, The Univ. of Nevada, Reno, and U.S. Ecology which is now using it. It is available currently in bulk (per ton) or in 33.3lb bags. Would you like a sample?

A. Although the Oil Program Center does not endorse products, it does seek to provide information about new developments in oil spill response technology to the public and oil spill



professionals. If you would like to provide more detailed information about your product and the results of the recent tests, we will pass the information onto appropriate field personnel and consider noting the development in one of our outreach periodicals.

New Carissa Spill Comments

The Oil Program Center also receives comments about current spills and response efforts. The following questions and comments address the grounding of the New Carissa off the Oregon coast and the resulting spill.

Q. I have been following the wreck of the New Carissa. It is getting quite a bit of coverage in the news here in Oregon. I am hoping that you can help me understand something. What the heck is bunker oil or bunker fuel? I understand that the ship runs on diesel, so why would a ship like New Carissa have so much of this fuel on board? I know this is not your usual question but I have no idea who else to ask. Thank you for any thoughts.

A. This is in reply to your question to the EPA Oil Hotline regarding the bunker oil or bunker fuel carried on board the M/V New Carissa. This reply is general in nature since the Oil Program Center does not have detailed information on the design or operation of the vessel in question. The most accurate information on the vessel may be available from the Coast Guard which is the Federal On-Scene Coordinator and the Federal agency responsible for

monitoring foreign-flag merchant vessels in U.S. waters.

Bunker fuel oil is defined in the *Condensed Chemical Dictionary* as "a heavy residual oil used as fuel by ships, industry, and for large-scale heating installations." The *Condensed Chemical Dictionary* and an Exxon publication (*Encyclopedia for the User of Petroleum Products*) define fuel oil in terms of an ASTM Standard (American Society for Testing and Materials) which identifies six grades of fuel oil. Fuel oil is a broad term encompassing a broad range of distillates and residual fuels as identified by ASTM grades 1 through 6. The grades are as follows:

No. 1 - straight run distillate, used in domestic heating
 No. 2 - straight run or cracked used as general purpose or commercial fuel (diesel)
 No. 4 - heavier straight run or cracked distillate used in commercial or industrial burner installation not equipped with preheating facilities
 No. 5 and 6 - usually referred to as bunker fuels, usually preheated before being burned.

As to why the vessel had both diesel and No. 6 bunker fuel,

may be related to the specific operation of the vessel. At sea, the vessel may burn bunker fuel which is less expensive than marine diesel. When in coastal waters, the vessel may be equipped to use diesel fuel in the propulsion engine(s). Diesel fuel may also be on board to power electrical generators and other auxiliary services (fire pumps, emergency electrical power, cargo equipment) on the vessel.

You can access the following web site for more information:
<http://161.55.32.17:591/CARISSA/HOME.HTM>

One Commenter sent the following regarding the New Carissa incident:

Regarding the grounding of the New Carissa I have a suggestion. The Salvage Chief has a worldwide reputation as being a very successful salvor. This is due in good part to their ability to set sea anchors that hold against great forces. Why not use these sea anchors to hold an adsorbent oil boom outside the breaker line and parallel to the beach. With falling

seas I think the forces involved in stretching a containment line is within the capability of the Salvage Chief and it's anchors.

While watching the plume on the television and also observing the National Oceanic and Atmospheric Administration maps on the New Carissa web page I think a line strung well outside the breakers but parallel to the beach would intercept the outbound leachants.

After reading the information on the oil products involved I believe that a boom could also change the direction of the plume and spill. A short dogleg toward the shore at the North end of a long run could force much of the heavier crude balls back toward the sandy beach close to the wreck.

A composite boom would be a good idea. Adsorbent material to catch the smaller and lighter components of the spill and a harder boom to redirect the heavier oil clumps. If the boom itself would not handle the stresses of a long run the Salvage Chief could attach the boom to a cable stretched between the sea anchors. The Salvage Chief is used to working close to the breaker line.

I suspect the weak link in my idea may be the lack of sufficient quantities of oil boom materials in the State of Oregon, especially in Coos Bay.

If this idea worked it could lead to a method of containing the oil spill to the immediate vicinity of the wreck. Using heavy logging



equipment to set anchors on the beach a boom could be stretched to one of the sea anchors. This involves more complex forces and I expect considerable development would be needed. I think that the Salvage Chief could lay an outboard boom now. This could be a big step in oil containment.

I am sending the suggestion to NOAA, The Coast Guard, The Governors' office of the State of Oregon and to the Salvage Chief's main office. If you know of anyone else I should send it to please let me know.

The Oil Program Center welcomes your questions and comments. Please visit the web site to learn more about EPA's oil spill activities.

Internet Learning Center

The Oil Program Center's Internet "Learning Center" provides a resource for students, educators and other people interested in understanding the impacts of oil spills and how they are cleaned up. The web site describes what happens when oil is spilled; how the natural conditions at the spill site affect the fate of spilled oil; how oil can harm the environment and its impact on susceptible plant and animal species; and the tools and methods oil spill response personnel use to clean up spills. For students and teachers who want hands-on learning experiences, the site provides step-by-step instruction for

experiments students can perform at home or in the classroom.

The Learning Center's discussion of spill impacts describes the oil sensitivity of various types of freshwater and marine habitats. It explains how some organisms may be seriously injured or killed very soon after contact with the oil in a spill, as well as some of the effects that are more subtle and often longer lasting. For example, freshwater organisms are at risk of being smothered by oil that is carried by the current, or of being slowly poisoned by long-term exposure to oil trapped in shallow water or stream beds. In addition, oil potentially can have catastrophic effects on birds and mammals.

The spill cleanup web pages offer information about response mechanisms to control oil spills and minimize their impacts on human health and the environment. Most spill response equipment and materials are greatly affected by such factors as weather conditions and water currents. Damage to spill-contaminated shorelines and dangers to other threatened areas can be reduced by timely and proper use of containment and recovery equipment. Mechanical containment or recovery is the primary line of defense against oil spills in the United States. The Learning Center describes containment and recovery equipment such as booms, barriers, and skimmers, as well as natural and synthetic sorbent materials that are used to capture and store the spilled oil

until it can be disposed of properly.

Chemical and biological methods can be used in conjunction with mechanical means for containing and cleaning up oil spills. Dispersants and gelling agents are most useful in helping to keep oil from reaching shorelines and other sensitive habitats. Biological agents have the potential to assist recovery in sensitive areas such as shorelines, marshes, and wetlands.

For interested parties who do not have access to the Internet, the Oil Program Center publishes *Understanding Oil Spills and Oil Spill Response*. This publication offers a great deal of information on the same subjects presented in the Learning Center web site, including instructions for student experiments.

SPCC Outreach

Avoiding oils spills prevents environmental damage from occurring and reduces threats to human health. It also saves money by avoiding cleanup costs, damage to equipment and property, and the loss of the oil product itself. Given the environmental and economic costs of spills, prevention is a high priority of EPA's Oil Program Center. The primary tool EPA uses to prevent spills is the Spill Prevention, Control, and Countermeasure (SPCC) program.

We can best avoid the environmental and economic effects of oil spills by preventing and containing them in the first place. For more than two decades, EPA's SPCC program has worked at several hundred thousand oil storage facilities to prevent the discharge of all kinds of oil into the waters of the United States. EPA's approach to preventing oil spills combines planning and enforcement measures. To prevent oil spills, EPA requires owners or operators of certain oil storage facilities to prepare and implement SPCC Plans that detail the facility's spill prevention and control measures. EPA also enforces the oil spill liability and penalty provisions under the Oil Pollution Act of

1990, which provide incentives to facility owners/operators to take the necessary steps to prevent oil spills. EPA also conducts on-site facility inspections to ensure that facilities take adequate measures to prevent accidental discharges.

Although the regulations are a very important tool for prevention, it is equally important that the owners and operators of regulated facilities be informed about the regulations and understand the requirements. The Oil Program Center web site offers a wealth of SPCC information in an easily accessible form. By providing the information necessary to guide decision making and develop effective SPCC plans,

the Oil Program Center helps oil storage facilities comply with the regulations. SPCC resources available on the web site include:

- Information about the types of facilities that are required to prepare SPCC plans;
- The elements SPCC plans must include;
- How EPA conducts facility inspections to ensure and improve compliance; and
- Key provisions of the Oil Pollution Act of 1990.

Having this information at their fingertips can aid facility owners and operators in preparing and reviewing SPCC plans to better protect the environment and resources around them.

United States
Environmental Protection
Agency (5203G)
Washington, DC 20460

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\$300

First-Class Mail
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EPA
Permit No. G-35